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USSR PROGRESS IN PRODUCTION
AND APPLICATION OF ORGANIC DYE STUFFS

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The production of synthetic dyestuffs began in the last century. In 1840, an oily liquid was obtained by the distillation of the natural blue dyestuff, indigo, to which caustic soda had been added. This liquid was subsequently called aniline. However, this substance could not as yet serve as the raw material for the production of synthetic dyestuffs. The building of the new branch of industry [the synthetic dyestuff industry] became possible only as the result of the discovery by the eminent Russian academician and chemist N. M. Zinin, in 1842, of a synthetic method of obtaining aniline from the products of the dry distillation of coal.

During recent years, Soviet chemists have developed techniques for obtaining new vat dyestuffs of all hues, which are far more durable than the cloth itself. Vat Blue O, Vat Azure K, Vat Bright Violet K, Vat Bright Green S, Vat Bright Orange Kh, Vat Golden Yellow ZhKh, and others belong to this category. These substances withstand heating up to 300 degrees. They dissolve only in concentrated sulfuric acid, which is destructive to all types of textile fibers, and can be recovered in an unchanged state by diluting the acid solution with water.

Dyeing with vat dyestuffs is not the only method of applying dyes to the fiber. A method frequently used is that of forming the dye directly on the cloth, in which case the final stage of producing the dye substance is transferred from the chemical plant to the textile factory. This method of dyeing is called the "cold process." It is more frequently utilized in printing colored design than in uniform dyeing. In this process the cloth is presoaked with a special substance, azotol [Naphthol AS]. By its reaction with another chemical substance, diasol [Fast Color salt], an insoluble dye belonging to the azo-dye class is formed. Applying different diasols to isolated places on a cloth soaked in azotol produces differently colored insoluble dyes, thus making it possible to obtain a multicolored design.

Every type of fiber -- cotton, wool, rayon, natural silk, synthetic fiber, caprone, etc. -- has its own type of dye which is unsuitable for dyeing other types of fiber.

There are dyestuffs corresponding to all primary and transitional colors of the spectrum and also white dyes, i.e., colorless organic substances, which fluoresce with a blue color, and give to a dyed surface the appearance of snowy whiteness.

But dyes are not used only in the production of textiles. The majority of consumer goods are subjected to dyeing by various colors to improve their quality and exterior appearance. Special dyestuffs are needed to dye furs, leather, rubber, plastics, paper, and wood; and to color foodstuffs, polygraphic and paint pigments, lacquers and varnishes, etc. They are a necessary additive to photographic emulsions, serving to increase their sensitivity. Dyestuffs are used in producing colored signal smokes and for making brands of gasoline and other petroleum products. They are utilized in medicine, in biological and geological-geographic research, and in many other fields of science and industry. Compounds derived from the products of coal distillation serve as the basic raw materials

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for the production of dyes. These compounds are benzene, toluene, xylenes, naphthalene, anthracene, acenaphthene, carbazole, and others. In addition to the coke-chemical raw materials, various acids, alkalies, salts, chlorine, bromine, ammonia and other chemical products are used in the production of dyestuffs.

An efficient aniline dye industry has been built up in our country during the Soviet regime. In 1954 it will produce 27 new valuable dyestuffs.

Increasing the production of stable and bright organic dyestuffs of high quality enables us to meet the growing demands of various branches of industry.

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